

## LINEAR IC

# DUAL OPERATIONAL AMPLIFIER

## MB47358

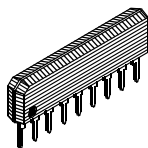
### DUAL OPERATIONAL AMPLIFIER OPERATES A SINGLE OR DUAL POWER SUPPLY

The Fujitsu MB47358 is designed for a general purpose dual operational amplifier with internal frequency compensation and to operate from a single power supply or dual power supplies. The MB47358 is suitable for audio with the fast slew rate and with the reduction of cross-over distortion. The MB47358 fits an application of microcomputer because of its wide output voltage range. The MB47358 is compatible with LM358.

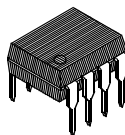
#### ■ FEATURES

- Not required compensation
- Wide power supply voltage range  
Single power supply: 3 V to 30 V  
Dual power supplies:  $\pm 1.5$  V to  $\pm 15$  V
- Wide output voltage range
- No cross-over distortion
- Fast slew rate  $-2$  V/ $\mu$ s typ.

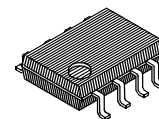
#### ■ PACKAGES



PLASTIC PACKAGE  
SIP-9P-M01



PLASTIC PACKAGE  
DIP-8P-M01



PLASTIC PACKAGE  
FPT-8P-M01

This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

# MB47358

## ■ ABSOLUTE MAXIMUM RATINGS (see NOTE)

( $T_A = 25^{\circ}\text{C}$ )

Rating	Symbol	Value	Unit
Power Supply Voltage	$V_{CC}$	36	V
Differential Input Voltage	$V_{ID}$	36	V
Common-mode Input Voltage	$V_{ICM}$	-0.3 to +36	V
Power Dissipation	$P_D$	350 ( $T_A \leq 55^{\circ}\text{C}$ )	mW
Operating Temperature	$T_A$	-20 to +75	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 to +125	$^{\circ}\text{C}$

NOTE: Permanent device damage may occur if the above Absolute Maximum Ratings are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## ■ PIN ASSIGNMENT

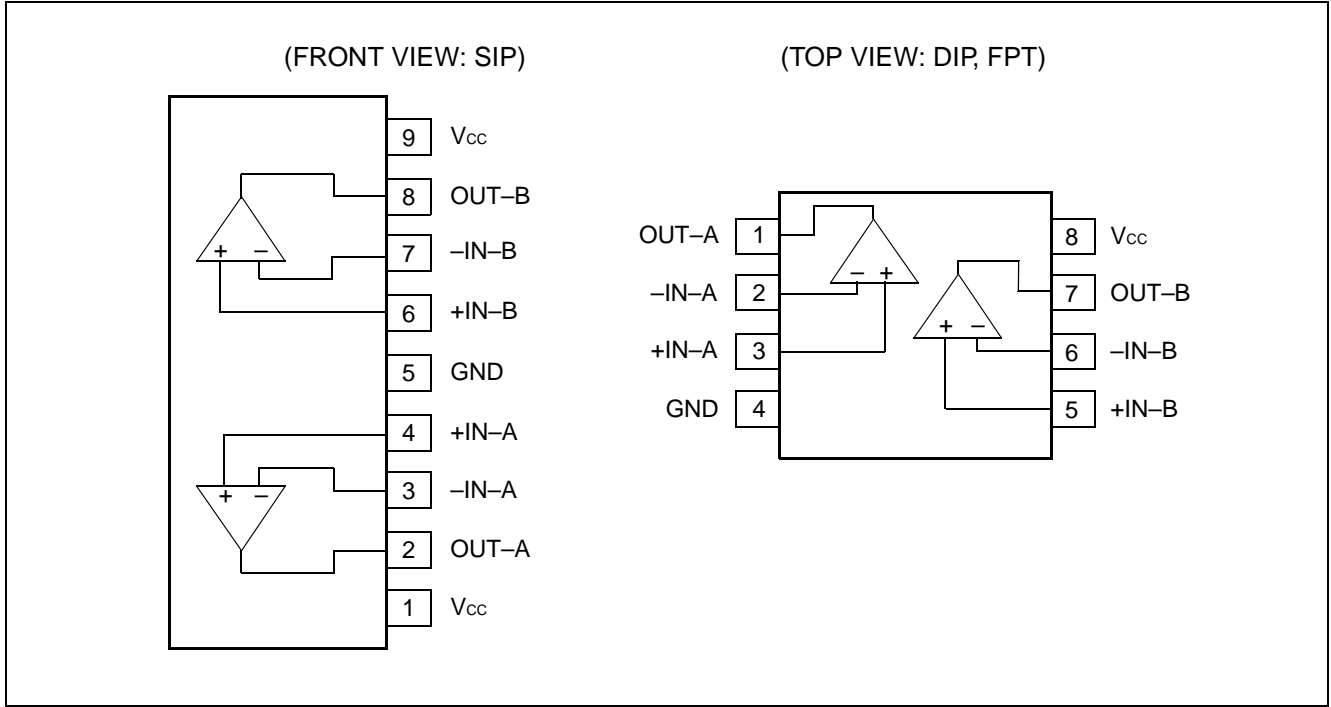
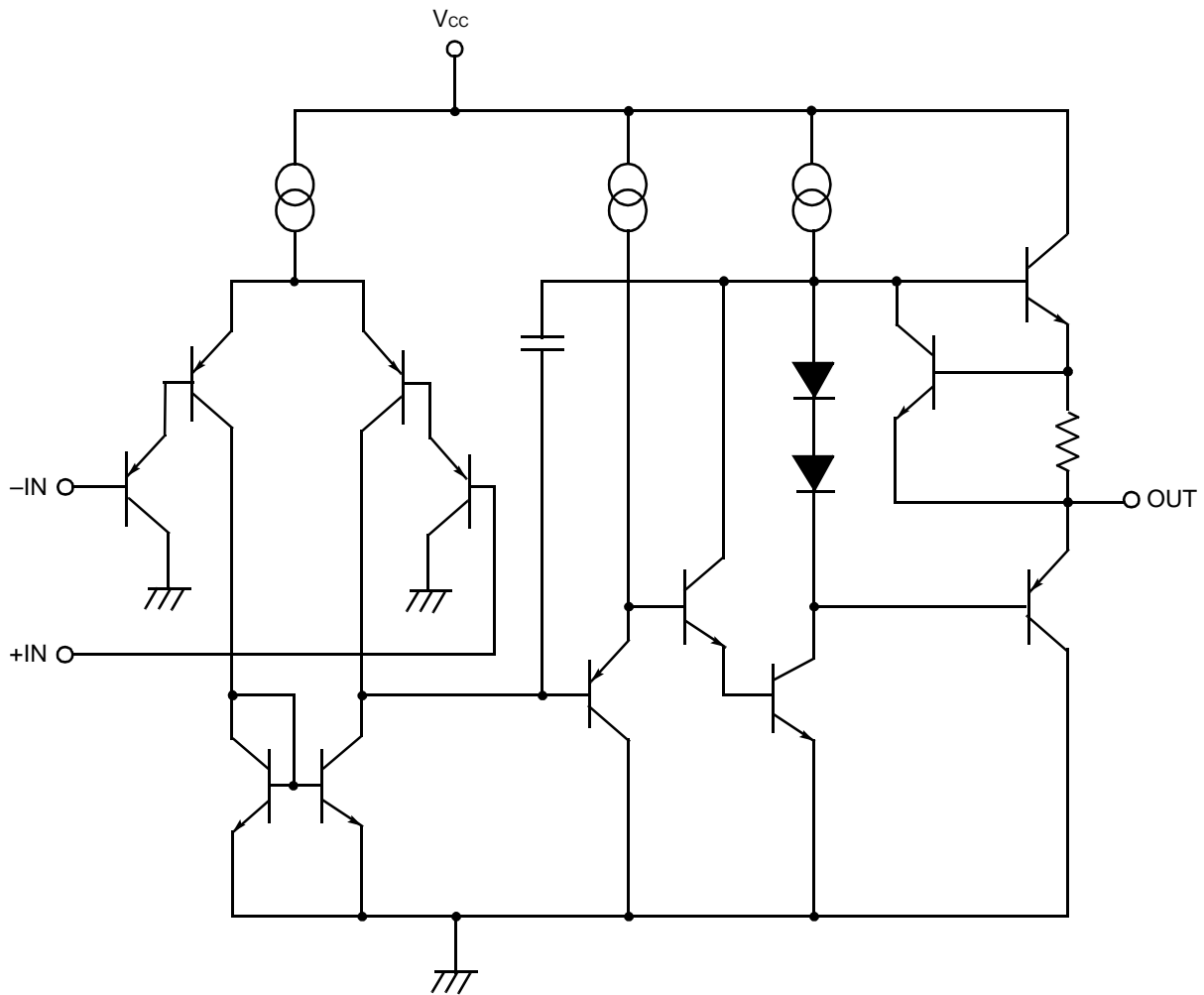


Fig. 1 — MB47358 EQUIVALENT CIRCUIT



## ■ RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Power Supply Voltage	$V_{CC}$	3 to 30	V
		$\pm 1.5$ to $\pm 15$	
Operating Temperature	$T_A$	-20 to +75	°C

## ■ RECOMMENDED OPERATING CONDITIONS

( $T_A = 25^\circ\text{C}$ ,  $V_{CC} = +5\text{ V}$ )

Parameter	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Input Offset Voltage	$V_{IO}$	—	—	2	7	mV
Input Offset Current	$I_{IO}$	—	—	5	50	nA
Input Bias Current	$I_{I^*}$	—	—	45	250	nA
Power Supply Current	$I_{CC}$	$R_L = \infty$ , $V_{CC} = 5\text{ V}$	—	2.0	3.0	mA
Common-mode Input Voltage	$V_{ICM}$	—	0	—	$V_{CC} - 1.5$	V
Voltage Gain	$A_V$	$R_L \geq K\ 2\text{ k}\Omega$	25	100	—	V/mV
Common-mode Rejection Ratio	CMRR	—	65	85	—	dB
Power Supply Voltage Rejection Ratio	SVRR	—	65	100	—	dB
Output Voltage	$V_{OH}$	$R_L = 2\text{ k}\Omega$	3.5	4.1	—	V
		$R_L = 10\text{ k}\Omega$	4.0	4.2	0	V
	$V_{OL}$	$I_{SINK} \leq 60\ \mu\text{A}$	—	0.2	0.4	V
		$I_{SINK} \leq 2\text{ mA}$	—	0.8	1.5	V
Maximum Output Voltage	$V_{OM}$	$R_L \geq 10\text{ k}\Omega$ , $V_{CC} = \pm 15\text{ V}$	$\pm 12$	$\pm 14$	—	V
		$R_L = 2\text{ k}\Omega$ , $V_{CC} = \pm 15\text{ V}$	$\pm 10$	—	—	V
Output Current	$I_{SOURCE}$	$V_{IN+} = 1\text{ V}$ , $V_{IN-} = 0\text{ V}$ , $V_{CC} = 15\text{ V}$	20	40	—	mA
	$I_{SINK}$	$V_{IN+} = 0\text{ V}$ , $V_{IN-} = 1\text{ V}$ , $V_{CC} = 15\text{ V}$	10	20	—	mA
		$V_{IN+} = 0\text{ V}$ , $V_{IN-} = 1\text{ V}$ , $V_O = 0.4\text{ V}$	60	150	—	$\mu\text{A}$
Channel Separation	CS	$f = 1\text{ kHz}$	—	120	—	dB
Slew Rate	SR	$R_L = 2\text{ k}\Omega$	—	2	—	V/ $\mu\text{s}$

Note: A direction of the input bias current flows from IC because first input transistor consists of PNP.

## ■ TYPICAL CHARACTERISTICS CURVES

Fig. 2 – POWER SUPPLY VOLTAGE vs. POWER SUPPLY CURRENT

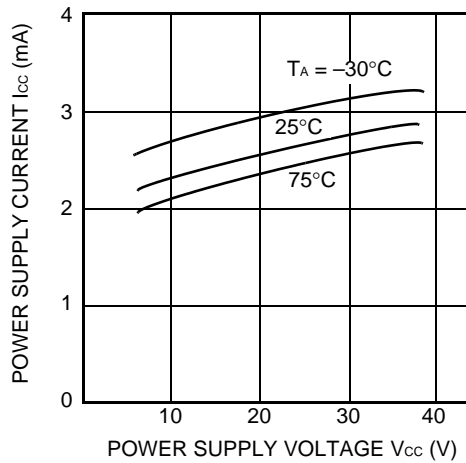


Fig. 3 – OUTPUT CURRENT vs. OUTPUT VOLTAGE

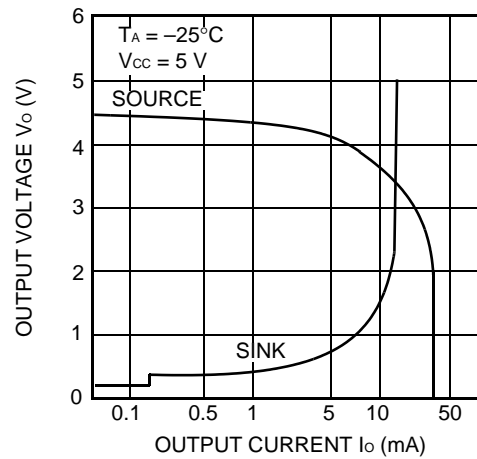


Fig. 4 – TEMPERATURE vs. INPUT BIAS CURRENT

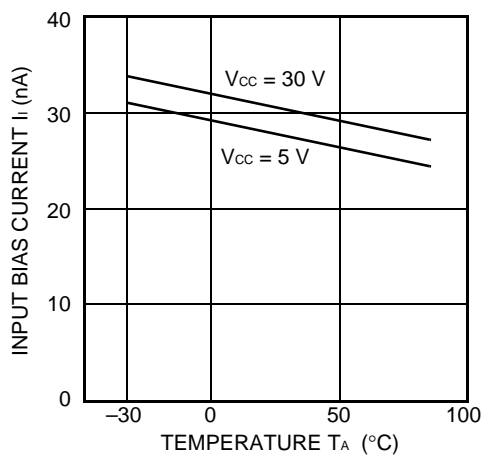


Fig. 5 – FREQUENCY vs. OUTPUT VOLTAGE

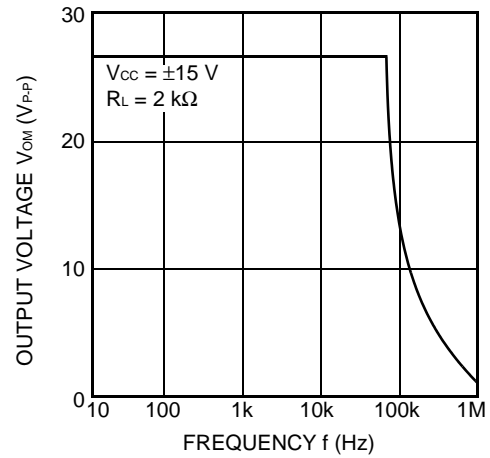
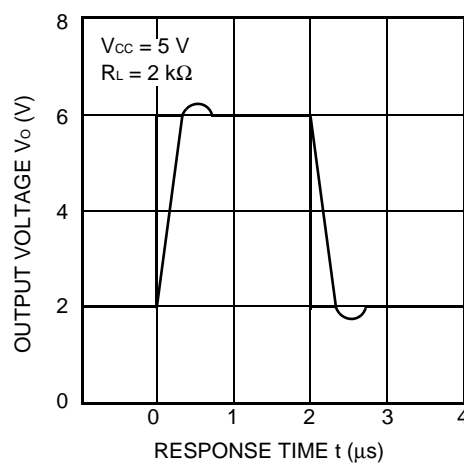
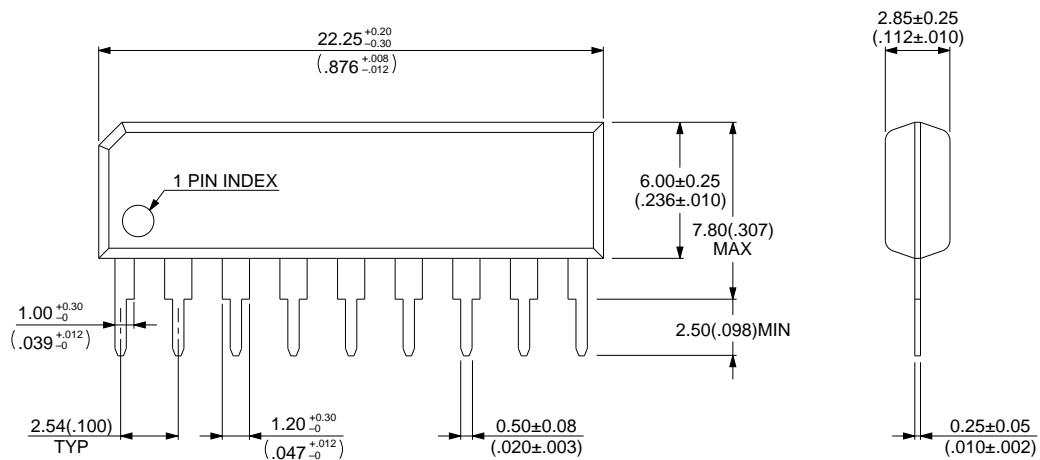


Fig. 6 – PULSE RESPONSE



## ■ PACKAGE DIMENSIONS

9 pin, Plastic SIP  
(SIP-9P-M01)

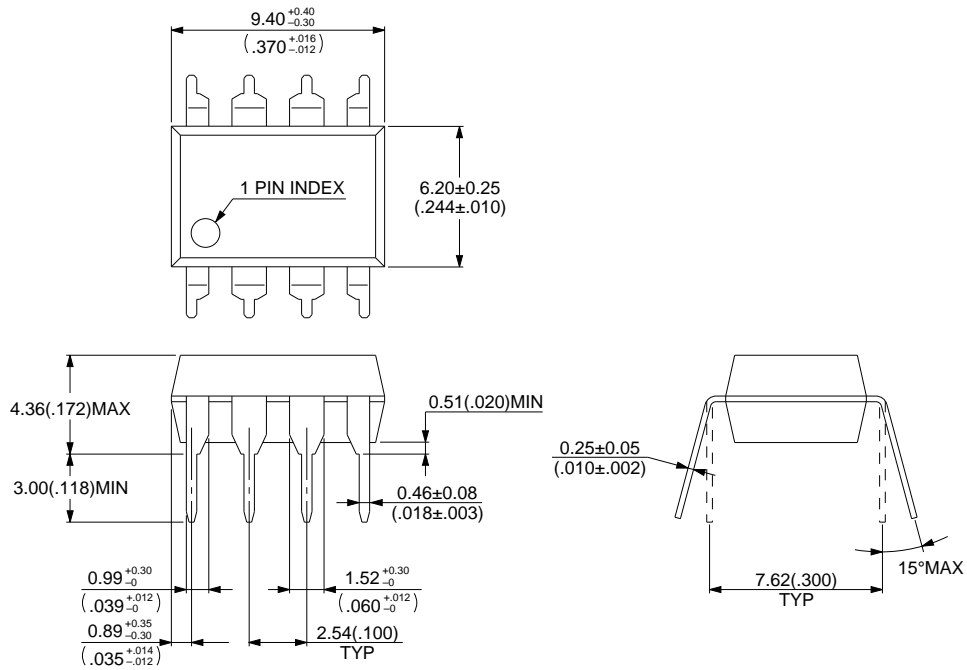


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Dimensions in mm(inches).

## ■ PACKAGE DIMENSIONS (Continued)

8 pin, Plastic DIP  
(DIP-8P-M01)

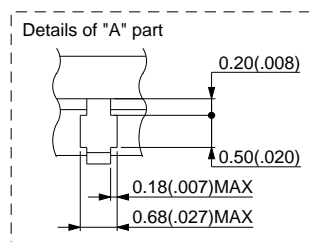
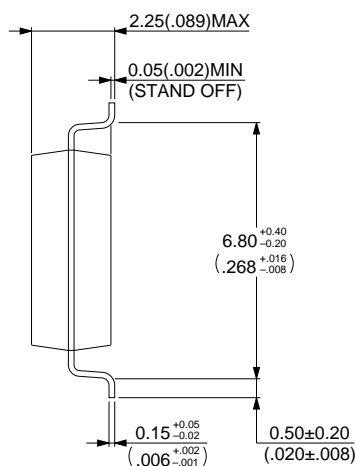
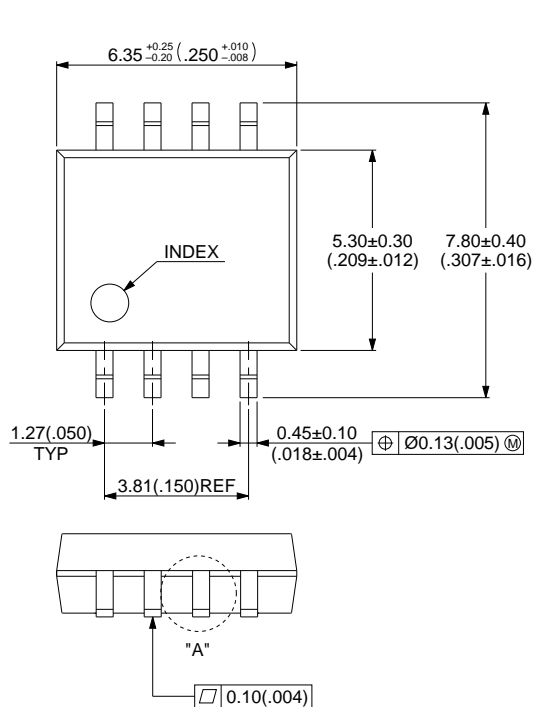


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Dimensions in mm(inches).

## ■ PACKAGE DIMENSIONS (Continued)

8 pin, Plastic SOP  
(FPT-8P-M01)





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